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CONTENTS

I. GENERAL INFORMATION

National

Short Wavelength Blue Light Used in Cultivating Strong Rice Seedlings
(Ni Wen; YUNNAN NONGYE KEJI, 25 Jan 80)..... 1

Dwarfing, Fruiting Strength of Wheat Varieties Studied
(Xu Feng; YUNNAN NONGYE KEJI, 25 Jan 80)..... 5

Xian Hybrid Rice Developed, Popularized
(Tian Changwei, et al; YUNNAN NONGYE KEJI, 25 Jan 80).. 10

Briefs

Water Resource Recommendation 24
Pigskin Product Fair 24
National Meteorological Conference 24
Increased Vegetable Oil Production 25
Commercial Cattle Bases 25

Anhui

Brigade Profits From Rules
(Anhui Provincial Service, 10 Aug 80)..... 26

Briefs

Wheat-Production Meeting 27
Rapeseed Delivery 27
Cropfields Flooded 27
Summer Grain Procurement 27

Fujian		
Province Cited as Model for Sugar Cane Production		
(XINHUA, 18 Aug 80).....		28
Briefs		
Rice Harvest		30
Sugar Purchases		30
Gansu		
Briefs		
Mongolian County Founding		31
Guizhou		
Underground Streams Discovered in Province		
(XINHUA, 16 Aug 80).....		32
Heilongjiang		
Swedish Forestry Delegation To Visit Heilongjiang for Talks		
(SVENSKA DAGBLADET, 14 Aug 80).....		33
Briefs		
Forestry Enterprises		34
Hubei		
Briefs		
Natural Disasters		35
Hunan		
Briefs		
Cotton Price Circular		36
Prefecture Flood		36
Rainfall Account		36
Jiangsu		
Briefs		
Compulsory Retirement Scheme		37
Flood Warning		37
Jiangxi		
Briefs		
Early Rice		38

Liaoning		
Briefs		
Liaoning Grain Center		39
Cocoon Output		39
Small Enterprises		39
Nei Monggol		
Policies To Promote Economic Development Adopted		
(XINHUA, 19 Aug 80).....		40
Qinghai		
Briefs		
Preserved Forest Discovered		42
Livestock Products		42
Agricultural Policy		42
Circular Issued		43
Shaanxi		
Briefs		
Autumn Farming		44
Shandong		
Briefs		
Livestock Breeding		45
Cotton Crop Management		45
Shanghai		
Briefs		
Torrential Rainfall		46
Xinjiang		
Briefs		
Afforestation Results		47
Circular on Livestock		47
Scientists Survey 'Natural Reserve'		47
Zhejiang		
Briefs		
Fruit Harvest		48

II. PUBLICATIONS

Table of Contents of 'YUNNAN NONGYE KEJI,' January 1980	49
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I. GENERAL INFORMATION

SHORT WAVELENGTH BLUE LIGHT USED IN CULTIVATING STRONG RICE SEEDLINGS

Kunming YUNNAN NONGYE KEJI [YUNNAN AGRICULTURAL SCIENCE AND TECHNOLOGY]
in Chinese No 2, 25 Jan 80 pp 19-23

[Article by Ni Wen [0242 2429] of the Kunming Plant Research Institute of the Chinese Academy of Sciences: "Cultivation of Strong Seedlings of Paddy Rice Using the Blue Light of Short Wavelength"]

[Excerpts] Cultivation of seedlings is a very important measure in paddy rice production. The key to cultivation of seedlings is how to safely cultivate seedlings and cultivate healthy seedlings. Cultivating strong seedlings is also an important link in seizing high and stable yields of paddy rice. A popular saying said: "A good seedling is half a grain." This indicates that with a strong seedling, bumper harvest can be assured.

In recent years, many regions in our province popularized the use of thin sheets to cultivate seedlings and of cultivating seedlings in greenhouses and a series of new measures of agricultural techniques of cultivating seedlings. These measures can effectively and safely cultivate seedlings, prevent rotting of seedlings, and can cultivate a definite number of healthy seedlings. This has pointed out a future for cultivating seedlings in a factory environment. But most of the thin sheets or glass we are using at present are transparent or semi-transparent and colorless. Colorless thin sheets or glass emit a mixture of lightwaves of the spectrum of sunlight such as red and orange light of long wavelengths, yellow and green light of medium wavelengths and a part of light blue light of short wavelength. Therefore, the condition of rice seedlings cultivated under the lack of light of short wavelengths is poorer. Especially when the temperatures are high, and when sunshine is insufficient, the rice seedlings will grow profusely, yellow or whiten frequently. For this, some remedial measures have been used in some areas, such as removing the film, early drying of the seedlings under the sun or placing small seedlings in a bed after being removed from the nursery bed and such methods to increase absorption of light of short wavelength of sunlight such as blue light, violet light and ultraviolet light so that the quality of the health of the rice seedlings can be raised.

In view of the problems mentioned above, and combining natural characteristics and the practice of using thin sheets, we conducted an experiment of cultivating rice seedlings under single colors using different colored sheets. The purpose was to find the functional spectrum of cultivating healthy seedlings and provide a complete theoretical basis for the present efforts in using thin sheets and greenhouses to cultivate seedlings and for facilities to cultivate seedlings in a factory environment. The method of our experiment and the results of the experiment are summarized below:

I. Materials and Method of the Experiment

The paddy rice variety used as material for the experiment was "0090." The seeds were selected and disinfected, forced to germinate until the plumule sheath showed a white tip and then were sown in clay pots for seedling cultivation. The pots were 30 centimeters long x 20 centimeters wide x 5 centimeters tall. A layer of soil 2 centimeters thick from the rice fields was placed inside the pot. In each pot was sown 10 grams of seeds (The amount of seeds sown in one shi mu is about equivalent to 250 shi jin).

The color sheets used were the transparent polyester sheets produced in Shanghai. They were in red, yellow, blue and colorless. Measurements using the Shimazu U-V210A type dual light beam spectrophotometer showed that the blue sheet emitted the blue light of wavelength of between 350 nm and 450 nm (millimicrometers). The yellow sheet emitted yellow light of wavelength of 525 nm to 600 nm. The red sheet emitted red light of wavelength of 620 nm to 760 nm. The colorless mixed light emitted by the colorless sheet was used as contrast.

The method of experiment: After sowing the seeds in the seedlings cultivation pots, the pots were covered by a color sheet. The covered pots were then placed under natural light for cultivation. They were placed under sunlight each day for 10 hours. The average daytime temperature was between 25° and 28°C. When the three true leaves opened up completely, the sheets were removed and light treatment was ceased. Then the seedlings were selected and transplanted or measured.

II. Experimental Results

(1) Quality of Growth of 12 Days of Cultivation of Rice Seedlings

A survey of the rice seedlings cultivated under different light emitted through the color sheets was conducted. Rice seedlings cultivated under the long wavelength of red light under the red sheet extended and grew rapidly. The plants were narrow and long, the leaves were thin, the dry weight/plant height ratio of the single seedling was small. That meant the weight of dry substance per unit length was small. Profuse growth

of rice seedlings cultivated under the short wavelength of blue light emitted by the blue sheet was visibly suppressed. This benefitted the formation of the shape of the plants. The plants were short and strong. The leaves were thick and full. The leaf sheath was short. The weight of dry substance per unit length was heavy. The growth efficiency (percent) of the rice seedlings was high. The uniformity of plant height (percent) of the growth of rice seedlings in the colony was high.

IV. Abstract

1. The long wavelength of red light (600-760nm) stimulates the rice seedlings to extend lengthwise and growth. The plants grow long and thin profusely. The leaf sheath is long, the leaves are relatively thin, the ratio of dry weight/plant height of the single seedling is small, the growth efficiency (percent) of the rice seedling is low and the uniformity (percent) of plant height of the rice seedlings in the colony is poor. Blue light of short wavelength (350-450nm) has the effect of suppressing the profuse growth and lengthening of the rice seedlings. The plants are short and strong. The leaves are full and fat and thick. The leaf sheath is short, the ratio of dry weight/plant height of the single seedling is large, the growth efficiency of the rice seedling (percent) is high, the uniformity (percent) of the plant height of the rice seedlings in the colony is high, and the rice seedlings appear uniform and strong.

2. Blue light of short wavelength can stimulate the formation of chlorophyll in the rice seedlings, raise the content of chlorophyll and the ability to retain chlorophyll.

3. Blue light of short wavelength can effectively stimulate the vitality of photosynthesis of the rice seedlings and raise the speed of photosynthesis of rice seedlings. The intensity of photo-respiration and the supplementary point of CO_2 (PPM) are relatively low, and this benefits the synthesis of more photosynthetic products.

4. Blue light of short wavelength can stimulate the formation and accumulation of carbohydrates in rice seedlings. The content of carbohydrates is high, especially the contents of starch and fibrin are relatively high.

5. Rice seedlings cultivated under blue light of short wavelength return green faster and tiller early after the rice seedlings are transplanted. There are more tillers on the single seedling. During the period of maturation, the number of grains per panicle is higher and the fruiting percentage (percent) is high, benefitting increased production.

Finally, this experimental method shows that the procedures of agricultural technology using blue light of short wavelength filtered through the blue sheet to cultivate paddy rice and grow healthy seedlings are basically the same as the customary use of thin sheets to cover the seedlings for

cultivation and in the cultivation of seedlings in greenhouses. The procedures are selection of seeds, soaking of the seeds, disinfection, cleaning, forced germination (until the white tip shows), sowing the seeds and covering the seeds under sunshine.

The experimental results of this experiment shows that using blue light of short wavelength to cultivate rice seedlings can raise the quality of the healthy seedlings, cultivate seedlings with a rather high uniformity (percent) and strong seedlings of consistently healthy seedlings. It can thus be seen that using blue light of short wavelength combined with the use of thin plastic sheets customarily being used at all places at present to cultivate seedlings, with cultivation of seedlings in greenhouses and with cultivation of seedlings in a factory environment is meaningful theoretically and has a great significance in practice.

9296

CSO: 4007

DWARFING, FRUITING STRENGTH OF WHEAT VARIETIES STUDIED

Kunming YUNNAN NONGYE KEJI [YUNNAN AGRICULTURAL SCIENCE AND TECHNOLOGY]
in Chinese No 2, 25 Jan 80 pp 5-11

[Article by Xu Feng [1776 7364]: "Study of the Dwarfing and Fruiting Strength of Wheat Varieties"]

[Excerpts] The variations in the plant height, surface area of leaves and the fruiting characteristics of wheat varieties are great. It has been discovered in the nurseries of the original wheat varieties that the tallest plant types can reach a height of 170 centimeters and the shortest plants are less than 40 centimeters. The original types of wheat are mostly relatively tall types. As agricultural production developed and the techniques of cultivation become more intense, especially since the strengthened selection of short stemmed varieties in wheat breeding, the height of the plant, the weight of the stems and leaves and the quality of the stems and such characteristics have exerted a series of profound effects upon the shape. This article will analyze the fruiting strength and the characteristics of stems and leaves of wheat varieties.

The experimental work was conducted in Su Xian in the northern Huai River region. The soil's fertility is upper medium in level. In ordinary years, wheat is sown around October 20, and harvested in the first 10 days of June. Each variety of plants is planted in a small area of two to four rows. The row is 4 to 6 chi long. The distance between rows is 1 chi and the plants are 1 cun apart. The sample section is 2 to 3 chi long. Forty stems and spikes are taken at random for examination of the varieties and analysis. The average numerical values are computed for each characteristic. They are compared in groups and the distribution of the numbers and correlation are computed statistically. The central trend is sought among the manifestations of the characteristics from the massive amount of data to find regularity. Specialized experiments are conducted upon this basis to test the regularity and analyze the causes. Because manifestation of the characteristics by the varieties and their conditions of growth are closely related, the actual values of the characteristics mentioned in this article are not important. The regularity and the trend of variation reflected by the massive amount of data are important.

6. Discussion

It is generally believed that the short stemmed characteristic helps to produce high yields because it can increase resistance to lodging. But, people often do not pay sufficient attention to the inner connection between dwarfing and the factors of yield. Many studies have pointed out that the yields of rice and wheat are closely related to the number of grains in a unit area. When a variety of wheat of medium level yield is transformed into a variety of high level yield, the number of fruited grains in a unit area is an important factor decisive to the potential of the variety for increased yield. The data illustrated in this article show dwarfing elevated the relative fruiting strength and the fruiting strength in a unit area of a variety. This may be an important reason that the level of yield of a dwarfed variety can be elevated. The elevation of the yield of many crops is linked to a certain dwarfing and strengthening of the plant type. Actually, in many crops, such as corn, soybeans, yams, and peanuts and their improved varieties or their original varieties or wild growing types, various degrees of dwarfing or shortening and straightening of the stems have already occurred. Some did not occur out of the need to prevent lodging. This shows dwarfing and elevation of the fruiting strength of the varieties are related internally on a widespread basis.

Why dwarfing raises the fruiting strength is a question that requires profound study.

The period from the beginning of differentiation of the primordial body of the spikes to the formation of seed grains after flowering is the period that determined the number of grains on the spike. After the wheat plant has begun to grow and has jointed, the center of growth which is in the leaves and tillers during the early growth period shifts to the stems and spikes. Especially from jointing to heading, the growth of stems and spikes is tremendous. The metabolism of nutrients in the plants directly affect the development of the spikes and flowers. If the accumulation of nutrients is insufficient for growth needs, few small spikes and small flowers are formed and the small flowers degenerate en masse during differentiation. The metabolism of nutrients of the tall stemmed varieties and the short stemmed varieties are very different. During this period, plants of tall stemmed varieties grow in size much faster than the accumulation of dry substances. The assimilated products stored within the body of the plant are also mobilized and consumed. The stems of the short stemmed varieties extend slowly, the internodes are short, and jointing is late. Our survey of 101 varieties of 2 groups of plant heights of 101 to 110 centimeters and 71 to 80 centimeters in 1972 showed the jointing period of short stemmed varieties is later than that of tall stemmed varieties on the average by 3 to 9 days (winter varieties joint 3 days later, semi-winter varieties joint 7 days later, vernal varieties joint 9 days later). Because the rate of growth of the stem of short

stemmed varieties is slow, the body of the stem is small, the nutrients consumed for the growth of the stems is also less but the surface area of the leaves is not small. The ability for photosynthetic production is still relatively high, and more carbon and nitrogen compounds can be supplied to satisfy the needs of the development and growth of the spikes, and more can be accumulated to benefit the fertilization of spikelets and the formation of seed grains after heading. Therefore, prior to filling of the seed grains of short stemmed varieties, the stems and leaves seemed to be strong and have full body. Their color is good; especially on winter short stemmed varieties, the color is deep green and they are erect.

The results of our observation of 17 varieties conducted in 1978 show that at the beginning period of heading of wheat (the part of the spike that has emerged from the leaf sheath is no longer than one-third of its total length). Extremely short stemmed varieties (plant height 40 to 50 centimeters) have stems that are only 2 times the length of the spikes. The weight ratio of the stem and the spike is near 1:1. The length of the stem of the tall stemmed varieties (plant height between 100 and 130 centimeters) is equivalent to 7 times the length of the spikes. The dry weight of the stem is three times the dry weight of the spike. The dry weights of the leaf and of the leaf sheath of the tall and short stemmed varieties are not very different. The dry weight of the stem of tall stemmed varieties is visibly heavier than that of the short stemmed varieties. At the beginning period of heading, the leaf is the major organ that supplies carbohydrates. The stem and the spikes are the centers of growth. The ratio of the weight of the leaves and the weight of stems and spikes of short stemmed varieties is higher (1:1.81) and that of tall stemmed varieties is lower (1:2.87). The supply of nitrogen and carbon in plants of the short stemmed varieties is better. When the combined weight of the stem and spike is the whole number 1, the shorter the variety of wheat, the larger the ratio of the dry weight of spikes. During growth and differentiation, the proportional distribution of the total amount of nutrients of the plant applied to the stem and the spikes of different varieties is different. In extremely short stemmed varieties, the two are almost evenly distributed. In tall stemmed varieties, the proportion distributed to the spikes is less than one-fourth. It can thus be seen that the growth and development of spikes and flowers of short stemmed varieties are in a superior position beneficial to raising the fruiting strength. Many studies prove that using dwarfing chemicals to treat wheat causes the plants to shorten and the stems to thicken and harden. The leaves become dark green and erect, the leaf surface area does not change or slightly increases. There are very few small sterile spikes and there are more grains on the spike. Reports in this regard are very similar to the situation we observed in short stemmed varieties. Tall stemmed varieties show the opposite. After the beginning of growth, the growth of the stem is strong, vegetative growth and reproductive growth sharply conflict. This is very unfavorable to the growth and development of spikes and flowers, especially after the spikes begin to differentiate. Winter tall stemmed varieties that head early have even fewer grains on the spikes.

Increasing the fruiting strength of the unit vegetative organ (number of grains per gram of straw) and the number of grains in a unit area raises the storage ability of photosynthetic production. This provides the most important condition of raising the economic yield. The short stemmed varieties have built a very large storage (number of seed grains) under limited conditions. This enables them to fully utilize the ever-increasing soil fertility and light energy and thus have a greater potential for production. The tall stemmed varieties have built a large supply source (stem, leaves) and a smaller storage under limited conditions. Therefore, the economic yield is greatly limited by necessity. But, dwarfing is only one important factor that affects the relative fruiting strength of varieties. Varieties of the same height but of different origins also have very different relative fruiting strength.

The number of grains per gram of straw is the relative value of the vegetative and fruiting organs. It can be regarded as the ratio and indicator of the source and storage. A more accurate representation of the ratio of source and storage organs is the ratio between the total photosynthetic area (leaf surface area + area of the spikes and awns + the area of green stems) and the total volume of the seed grains (number of grains \times the potential volume of the single grain), but this is very difficult to measure. When we examined the varieties we used the weight of straw (weight of straw of a single stem or weight of straw of unit area) as the source indicator. The number of fruited grains of the vegetative organ of a unit weight abbreviated the number of grains per gram of straw is used as the indicator or ratio of source and storage. This is an indirect and simple and convenient method of representation worth recommending. Its formula is:

Weight of straw = Total weight - weight of grains.

Number of grains per gram of straw = $\frac{\text{Total number of grains}}{\text{Total weight of straw}}$

or $\frac{\text{Number of grains on spike}}{\text{Weight of straw of single stem}}$

The relationship of source and storage of productive varieties after they have adapted to the region and the level of fertility is balanced. The number of grains per gram of straw has a definite range. In one ecological zone, the number of grains per gram of straw of modern high yielding varieties is often more than that of medium yielding varieties. For example, the number of grains per gram of straw of high yielding varieties of the plains of the middle and lower reaches of the Changjiang and the Sichuan Basin, Ning Mai No 3, Zheng Ying No 1, Fan 6 and Fan 7 is above 20 grains, while that of medium yielding varieties of Wan Nian No 2, E Mai No 6 is below 20 grains. The same high yielding variety yields more grains per gram of straw in the plains per gram of straw in the winter wheat regions of the northern part of north China and the wheat

regions of the plateaus of northwest and southwest is less. Varieties with a medium number of grains per gram of straw (such as A 86, Shangqian Mai etc) produce a medium level yield in the wet plains of high temperatures. But they are used as high yielding varieties in high latitude winter wheat regions or plateau wheat regions.

Under many conditions, a rise in the level of production of a variety is accompanied by an increase in the number of grains per gram of straw. But the higher the number of grains per gram of straw is not always better. The ratio of source and storage of a variety and the ecological condition are united. The limit of the advantage in dwarfing of varieties in each ecological zone may not be the same. In plateau wheat regions where the climate is mild and cool and sunshine is sufficient, the superior varieties of wheat of a plant height of over 70 centimeters may produce high yields. In the wheat regions of the plains of the middle and lower reaches of the Changjiang where sunshine is deficient and accompanied by high temperatures and suppressive heat, it may be difficult to selectively breed a high yielding and stable yielding wheat variety producing over 1,000 jin per mu that has a plant height of below 80 centimeters (cultivated in highly fertile cultivation fields).

9296

CSO: 4007

XIAN HYBRID RICE DEVELOPED, POPULARIZED

Kunming YUNNAN NONGYE KEJI [YUNNAN AGRICULTURAL SCIENCE AND TECHNOLOGY]
in Chinese No 2, 25 Jan 80 pp 12-18

[Article by Tian Changwei [3944 7022 0251], Chen Xingyou [7115 5281 0645]
and Liang Zhirui [2733 0037 3843]: "Several Views on Popularization of
Xian (Indica) Hybrid Rice"]

[Text] The successful experimentation and popularization of the xian (indica) variety of hybrid rice is an important achievement in our nation's scientific and technological research in agriculture. In 1979, this variety was planted in more than 100 million mu throughout the nation. It has actively served to promote increased production of paddy rice. In 1978, Jianshui County began to introduce varieties of the lanyou line for test planting. The tested plants covered 100 mu and 2 mu of sterile lines were cultivated. There were also 10.5 mu for seed propagation. Better results were obtained that year. The per mu yield of the demonstrative hybrid plants yielded more or less 1,000 jin. The highest per mu yield was 1,288 jin. In the propagation of the sterile line, the seeds were very poor in quality and the per mu harvest of sterile parents was 33 jin. The area for seed propagation of the lanyou No 2 was 8.5 mu. Average unit area yield was 174.9 jin. The area for seed propagation of Nanyou No 6 was 2 mu and the unit area yield was 129.7 jin. The results obtained this year have given people new inspiration and preliminarily demonstrated heterosis. It is believed that the xian variety of hybrid rice can be developed and popularized in the dam area in this country at 1,300 chi above sea level. Therefore, in 1979, the area of hybrid rice expanded to 6,145 mu. The area for propagation was 23.5 mu. The area for seed propagation was over 160 mu. This year, a big drought, the largest during the past more than 70 years occurred. Because of the high temperatures of the drought, the superiority of the hybrids was demonstrated even better and the plants showed a strong resistance to drought. Therefore, a better harvest was still realized. Hybrids usually maintained a yield of 1,000 jin per mu and the highest per mu yield reached over 1,400 jin. Fields seriously affected by drought could still yield 600 to 700 jin. The general per mu yield of propagated sterile lines was 50 jin and the highest approached 100 jin. The yield of seed propagation fields was

mostly between 80 and 100 jin per mu. The highest per mu yield broke the 200 jin level to reach 204 jin/mu. These results encouraged the active-ness of many cadres and commune members and masses in developing the production of hybrid rice. Most of the commune brigades have preliminarily accumulated some experience by test planting hybrid rice. It seems a trend in massive development of hybrid rice has already formed. Under this situation, we spent 2 years in practice. Several views concerning the questions which should be noted during the course of popularizing the xian variety of hybrid rice are presented here for discussion and study by comrades.

1. Question Concerning the Regional Adaptability of Nanyou Varieties

Any superior variety must require definite compatible living conditions. These conditions generally speaking can be divided into two aspects. One aspect is natural conditions which are temperature, light and such natural climatic conditions. The other aspect is cultivation conditions such as water and fertilization which can be controlled by man. Of course these two aspects are mutually related but in this section emphasis will be placed on questions related to the first aspect mentioned above. The following section will discuss questions concerned with the aspect of conditions of cultivation.

(1) The Reaction of Nanyou Varieties to Temperature and Light

The parental material of the Nanyou No 2 and Nanyou No 6 presently being test planted and popularized possess the strains of guo ji rice and huanan wild rice. The ecological conditions of the development of the guo ji rice line show they are strongly sensitive to temperatures and also strongly sensitive to light. One of the parents, or jiu nan No 1, which is an early rice variety of our nation's Changjiang River region shows they are varieties that are strongly sensitive to temperatures but weakly sensitive to light. Viewing the hybrid offspring generations of these parents, Nanyou varieties should be a type strongly sensitive to temperatures. Their sensitivity to light, as shown by the results of cultivation as intermediate and late rice in Hunan, belongs to the intermediate type. Therefore, the most important characteristic of Nanyou varieties is that during the period of heading and flowering, the requirement for temperature is more demanding. Studies conducted in Hunan and Guangxi provinces indicate during the heading and flowering periods, the most suitable daily average temperature is between 23° and 27°C. The fruiting percentage will be reduced by low temperature or high temperature hindrance when the daily average temperature falls below 23° or rises above 27°C.

(2) Temperature Conditions in the Jiangshui Dam Area

The Jiangshui Dam area has a subtropical plateau climate of low latitudes. The temperatures are stable. High temperatures are not outstanding during the growth season of paddy rice. The highest monthly average

temperature is below 24°C. The highest 10-day average temperature is also near 25°C. Therefore high temperature hindrance during the heading and flowering periods does not occur in the Jiangshui Dam area. But a visible characteristic of the low latitude plateau climate is that "there is no cold or hot weather throughout the four seasons and rain brings autumn." According to the temperature data of the 10 years from 1970 to 1979, the frequency of occurrence of low temperatures below 23°C during summer is very high. The reason is that when continuous overcast rain occurs, the temperature drops visibly. The temperatures during the periods of heading and flowering of hybrid rice, the middle and last 10 days of July and the first 10 days of August, show that in normal weather or in years of high temperatures, the temperature is near the critical temperature (23°C). In years of low temperatures or when overcast rain continues for over 3 days, the temperature visibly drops to below the critical temperature. Therefore, the patterns of nature show that the occurrence of low temperature hindrance is very frequent. In expanding the development of hybrid rice, this factor of unstable yield should be taken into consideration. During these 2 years of test planting of hybrid rice, the better harvests achieved were because the heading and flowering periods of Nanyou variety occurred under relatively high temperature conditions (basically all above 23°C). This was also luck.

(3) Growth Performance of Nanyou Variety in the Jiangshui Dam Area

The growth performance of the 2 years has some consistent characteristics: They are:

1. A relatively long growth period: Compared to those planted in Hunan, the entire growth period was longer by 20 days. There were two more leaves. The vegetative growth stage visibly lengthened. The leaf age during the effective tillering period was more than that of those planted in Hunan by over 1.5 leaves. The total cumulative temperature was higher than that in Hunan. The active cumulative temperature of Nanyou No 2 and Nanyou No 6 in the Jiangshui area was between 3400° and 3750°C. It can be seen from this that when cultivated in regions of different latitudes and although the number of hours of sunshine at the two localities is different, like such a low latitude region as Jiangshui where the number of hours of sunshine is shorter, the active cumulative temperature is still higher than in Hunan. This shows that the Nanyou variety belongs to the type with a relatively strong sensitivity to temperatures (Table 1).
2. Strong tillering strength: In general, on the basis of strong tillered seedlings and within an appropriate density range, the single plant yields over 16 tillers and over 10 effective tillers. This shows the superiority of a strong tillering strength.
3. The number of grains on the panicle is not ideal enough: Heterosis is manifested by a strong tillering strength and a deficient number of

grains and insufficiently large panicles. In general, the number of filled grains is between 70 and 120, and the number of grains on plants in individual high yielding fields is below 130. The performance is not as ideal as that manifested in other provinces. This may be related to conditions or measures of cultivation (to be discussed in the next section). The plants are not as tall as those of other provinces. Whether it is related to temperature still needs further investigation and study (see Table 2).

Table 1. Growth Manifestations of Nanyou Varieties

	1978	1978	1978	1979	1979	1979
	Nanyou No 2	Nanyou No 2	Nanyou No 6	Nanyou No 6	Nanyou No 6	Nanyou No 2
Sowing time (mo/day)	3/7	3/29	3/29	3/16	3/20	3/27
Transplanting time	4/10	5/10	5/10	4/14	4/19	5/6
Gardening time	6/3	6/21	6/19	6/13	6/15	6/21
Panicle bearing time	6/30	7/17	7/15	7/4	7/5	7/12
Heading time	7/13	7/28	7/30	7/14	7/16	8/1
Maturation time	8/12	8/30	9/2	8/25	8/24	9/8
Entire growth period (days)	158	154	157	163	159	165
Active cumulative temperature °C	3401.5	3408.9	3477.2	3655.6	3559.3	3752.2
Remarks	Because of the lengthening of the growth period due to different degrees of drought, the cumulative temperatures are higher than those of last year.					

Table 2. Manifestation of the Economic Characteristics of Nanyou Varieties

	1978	1978	1978	1979	1979	1979
	Nanyou No 2	Nanyou No 2	Nanyou No 6	Nanyou No 6	Nanyou No 6	Nanyou No 2
Plant height (cm)	77.4	67.0	71.4	83.5	78.8	85.0
Length of panicle (cm)	20.9	18.7	20.1	23.5	22.3	21.0
Number of grains formed (grains/panicle)	121	97.1	90.2	169.8	140.9	146.0
Number of filled grains (grains/panicle)	101.3	75.3	72.8	121.7	94.5	114
Fruiting percentage	84.7	75.8	80.7	71.7	67.0	75.0
Thousand grain weight (gn)	26.1	25.0	26.8	26.5	26.9	27.6
Yield (jin/mu)	1150	948	1010.6	1103.9	1293	1237

Table 3. Effect of Natural Temperatures Upon the Fruiting of Hybrid Rice

	1978				1979	1979	1979
	Nanyou No 6		Nanyou No 2		Nanyou No 6	Weiyou No 6	Aiyou No 6
Sowing time (mo/day)	3/29	6/6	3/29	6/16	3/24	3/24	3/24
Transplanting time	5/10	7/7	5/10	7/7	4/26	4/26	4/26
Heading time	7/30	9/8	7/28	9/22	7/14	7/17	7/23
Temperature of 7 days during heading period (°C)	23.3	22.2	23.2	19.7	23.4	22.9	22.0
Fruiting percentage	80.7	51.9	75.8	3.5	81.7	77.5	25.3
Yield (jin/mu)	1010.6	646.4	948	*	1166	1112.9	589.4

* Basically no harvest

4. Temperature conditions that affect fruiting: As mentioned above, the periods of heading and flowering of the Nanyou variety require an average temperature of between 23° and 27°C. Actual observation shows the temperature. The temperature is above 23°C. The fruiting percentage is normal, above 75 percent. When the temperature drops to 22.2°C, the fruiting percentage drops drastically to only 41.9 percent. When the temperature drops to 22°C, the fruiting percentage is even lower, only 25.3 percent. If the temperature drops to below 20°C, the plants basically cannot fruit (Table 3). Although 1979 was a high temperature and dry year, similar situations occurred. In the comparative experiment of hybrid and superior varieties conducted by the agricultural science team of the Ouyin Brigade of the Qujiang Commune, ai you No 6 (er jiu ai No 1A x Guo ji 26, the same type of variety as the nanyou No 6) headed on July 23. There were 4 days of continuous overcast and rain. The temperature dropped to 22°C, and the fruiting percentage was only 25.3 percent. The per mu yield was over 500 jin. This shows that these varieties are very sensitive to temperatures during the periods of heading and flowering. Statistics show that the frequency of occurrence of damaging low temperatures below 23°C during the middle and last 10 days of July and the first 10 days of August reached 73.3 percent. The frequency of occurrence of low temperatures below 22°C was 23.3 percent. This will greatly damage fruiting of hybrid rice varieties. Therefore, analysis of the natural patterns of the locality shows expanded development of these varieties under local conditions involves the dangerous factor of unstable yield.

Disease Resistance of the Nanyou Variety

The disease resistance of a variety is another important factor in high and stable yields. According to the combined survey of all the nation's southern rice regions (13 provinces and cities), resistance to white leaf wilt of paddy rice of the nanyou variety is highly sensitive. Although the resistance of each variety differs, they all belong to the susceptible type. Actual manifestation is the withering symptom. This means, all varieties that show withering symptoms are regarded as disease sensitive varieties. At the same time, studies also proved that withering type of white leaf withering disease and ordinary leaf withering type are of the same kind of pathogenic bacteria. It is regarded as a bacterial line of the white leaf withering bacteria that has a stronger ability to cause disease.

In 1978 when nanyou varieties were introduced for test planting, withering type white leaf withering disease still occurred on a small scale even though the seeds were disinfected under strict procedures and the comprehensive preventive measures taking cultivation as the key were implemented. The plants showed sensitivity to the disease. Only nanyou No 6 was only slightly affected by the disease. Therefore, in 1979 when the demonstration and popularization was expanded, nanyou No 6 was used as the main variety. In that year, the occurrence of drought and less rain were unfavorable to the occurrence of an epidemic of white leaf withering disease and therefore occurrence of the disease in large field production was less. After being affected by the disease, the epidemic began only after rain. Saturating rain occurs only during the last 10 days of August at Jiangshui Dam. Therefore, the time of the epidemic was late and the epidemic occurred only near the time of maturation and the loss was not great. But in Dongshan where rain came early, the disease occurred during the panicle bearing and heading periods at Qujiang Commune. In some fields there was an epidemic. In the Dongshan Commune, nearly 1,000 mu of fields were seriously affected by the disease (including the local hong gu variety). Nanyou variety was planted over 655 mu and all were affected. This situation indicates that in normal years and where there is more rain, the conditions are favorable for white leaf withering to become an epidemic. This weakness of the nanyou variety must also be taken into consideration in the planning for the development of production.

In addition, according to our preliminary investigation, the nanyou variety planted in Dongshan and Chenguan also carried bacterial stripe spot disease. This is a kind of disease to be quarantined. It has not occurred seriously at present but its expansion should be prevented, otherwise it will damage production greatly.

Resistance of the nanyou varieties to blast of rice shown by our experiments to determine disease resistance indicates that nanyou No 2 was resistant in 1976 and in 1977 it showed a medium resistance. In 1979,

it showed medium resistance in large field examination. Although nanyou No 6 did not participate in past determinations, its parent er jiu nan No 1 is a resistant type while guo ji 26 showed sensitivity to the disease. In this year's large field examinations, it also showed a medium resistance. Generally, the percentage of diseased leaves was widespread but the severity of the disease was light (Table 4). It is believed that this year's high temperatures and drought were unfavorable for blast of rice to become epidemic. Manifestations of naturally occurring diseases cannot yet be determined but there seems to be no doubt that it is a sensitive type.

The trend of development of hybrid rice in each province of the nation indicates the nanyou variety's resistance to disease is relatively poor, therefore the planting area has gradually been reduced in recent years and new hybrid superior varieties such as Shanyou, Zhenyou and such varieties have gradually replaced it. These experiences are worth our attention. The question concerning the resistance of a variety to disease must be fully emphasized in planning for the development of production.

Table 4. Results of Determination of Resistance to Blast of Rice of the Nanyou Varieties

Year	Varieties	Manifestation of Resistance to Disease			Remarks
		Seedling Blast	Leaf Blast	Panicle Blast	
1976	Nanyou No 2	R	R	R	"R" is resistant to disease
	Er jiu nan No 1	R	R	-	"M" is medium resistance to disease
	IR 24	R	R	-	"S" is sensitive to disease
	IR 26	M	M	-	
1977	IR 26	-	S	S	
	Nanyou No 2	-	M	S	
1979	Nanyou No 2	-	S	MR	Investigation in the large field
	Nanyou No 6	-	S	MR	

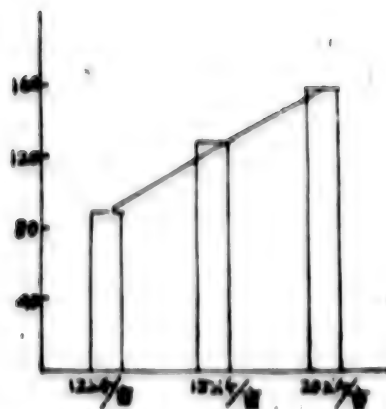


Figure 1. Effect of different amounts of fertilizers for jointing upon the number of grains on the panicle 1978 (Urea)

III. Key Techniques for Cultivation of High Yields

As mentioned in the above section, the growth manifestations of the nanyou variety generally are: an outstanding superiority in tillering but an insufficient number of grains and size of panicles. The major reason for the insufficiency in the superiority of large panicles is improper cultivation measures. Actual examinations of high yielding fields show manifestations of superiority of large panicles. Based on single plant yields, there is a 14.5 percent increase in yield. Therefore, efforts to achieve large panicles will also achieve greater potential for increased yield. This should be the major direction towards cultivation of high yields. A few major key techniques will be discussed in the following:

(1) Cultivating Healthy Seedlings with Tillers Is the Basis for Obtaining Large Panicles

Everyone knows the scientific principle that "a good seedling is half the grain plant." Under conditions in which the seedbed is well prepared, sparse sowing and even sowing are the key to cultivating strong seedlings with tillers. They assure that the individual seedling has a proper vegetative area and the occurrence of tillering. Actual investigations in production show that the number of tillers the day before transplanting of plants sown in different amounts (seedling age of 33 to 36 days) is visibly different. Of 96 jin of seeds sown in 1 mu, there were only 5.4 percent with tillers, or an average of 0.06 seedlings with tillers. Of 60 jin of seeds sown in 1 mu, there were only 14.3 percent with tillers, or an average 0.19 tillers on the single plant. Of 35.2 jin of seeds sown in 1 mu, there were 84.1 percent with tillers, or 3.9 tillers on the single plant. The quality of seedlings with different number of tillers is very different. Results of the tests of rooting strengths of

plants cultivated in water for 3 days after cutting off the roots (cultivated in clear water) show seedlings without tillers grew an average of 4.4 roots with an average length of 4.1 millimeters. The tillered seedlings with 1 or 2 tillers grew 6.8 and 8.4 roots on each single plant. The length of the roots were 9.9 and 13.9 millimeters. Multiple growth was manifested.

The experiment showed that tillered seedlings produced large panicles and increased yield. In 1978, in a comparative experiment in which the density of transplanting and management measures were consistent, the number of grains on the panicles of tillered seedlings was still more than others even though the transplanting density was slightly large (3×10 cun, 20,000 plants per mu) and the highest number of stems reached 360,000 to 380,000/mu and the number of grains per panicle was affected. The yield was the highest at 1,150 jin per mu. Tender single seedlings had slightly less number of grains per panicle and the per mu yield was slightly lower, reaching 1,138 jin. Tender seedlings transplanted as 2 plants per hole produced the least number of grains per panicle and the yield was also the lowest, only 1,063 jin. It can thus be seen that cultivating strong seedlings with tillers is the basis for obtaining large panicles.

Obviously, to cultivate strong seedlings with tillers, sparse sowing (20 to 30 jin of seeds per mu), even sowing (grid sown) and the selection of fertile seedbeds, fine preparation of the fields, application of sufficient base manure, opening of ditches according to the soil condition (generally the ditch is about 1 meter wide) are necessary. The surface of the ditch must be smoothed so that the ditches are not cluttered. This benefits drainage and irrigation. The surface of the ditch should be kept smooth and the wet method of seedling cultivation should be used. The seeds must be strictly disinfected and then forced to germinate and then sown. After sowing, fine sifted manure must be used to cover the seeds. After germination and the emergence of two leaves and one new leaf, "weaning fertilizers" must be applied once so that when the fourth leaf shows its tip, tillers can be seen and disease and insect prevention should be implemented timely. After the emergence of 5 to 6 leaves (about 30 days of leaf age), the entire field should be covered with growth. On the average, transplanting can be done when the seedlings have grown to possess a trident shape.

(2) Appropriately Sparse Planting Is a Necessary Condition To Obtain Large Panicles

The tillering superiority of nanyou varieties is outstanding. If the planting density is too large, the number of seedlings during the early period will be too high, the rows will be closed too early and shading between plants will affect the efficiency of photosynthesis. This is unfavorable to the development of the superiority of large panicles and

also it affects the rise of the percentage of panicle formation. Comparative experiments show that plants planted appropriately sparsely will produce large panicles and increased yield. For example, in the command field of the You Qiu Commune, 25,000 plants were planted in 1 mu at 3 x 8 cun, and its highest number of stems reached 515,000/mu, the number of formed panicles reached 244,000/mu, the percentage of panicle formation was only 47.4 percent. After inventory, the actual number of grains was 75.8, and per mu yield was 832 jin. In the neighboring fields where the soil fertility was about the same, 12,000 plants were planted in each mu at 5 x 10 cun, and the highest number of stems was still considered to be too high, reaching 366,000/mu, 251,000/mu of effective panicles, the percentage of panicle formation was 68.6 percent, the number of filled grains was 94.5, after inventory, the actual per mu yield was 1,293 jin. The planting density was reduced by more than onefold, yet each mu increased 461 jin in yield, the percentage of increased yield was 55.5 percent. Actually the number of empty and semifilled grains in this sparsely planted field was still relatively high and superiority of large panicles was insufficiently demonstrated and therefore is still a definite potential for increased production.

The experience of Hunan indicates that the overall design for the productive structure in cultivating high yielding nanyou variety is as follows: transplanting of 12,000 to 15,000 plants per mu with the highest number of stems controlled at between 250,000 and 300,000/mu, each mu should have about 200,000 effective panicles. The number of grains per panicle should be above 130. In combination with the practical results obtained locally, we believe this design is basically appropriate. If we consider the relatively low temperatures in summer at this locality, the plant height of nanyou varieties which is slightly shorter than that in Hunan, and the longer effective tillering period than in Hunan, then in cultivation of high yields at this locality, the most appropriate number of plants per mu would be 12,000. The highest number of stems should not be over 300,000/mu, there should be between 220,000 and 250,000/mu of effective panicles, and the number of filled grains per panicle should be between 130 and 150. In this way, there may be a new breakthrough in per mu yield.

(3) Increasing Application of Panicle Fertilizers Is a Material Assurance of Obtaining Large Panicles

In the past, in techniques of fertilization for ordinary plants, the method of fertilization of plants involved sidedressing for stimulation during the early period of growth, control during the middle period of growth and supplementary sidedressing during the last period of growth based upon a sufficient application of base manure. This fertilization technique frequently causes overstimulation of seedlings when used for hybrid rice such as the varieties with an especially strong tillering strength. The middle period of growth when the seedlings should be controlled is the rainy season and man cannot control the weather and thus

the formation of large panicles is affected. This may be one of the major reasons of the insufficient manifestation of the superiority of large panicles of the nanyou variety.

Therefore we used the method of fertilization to apply a stable amount of fertilizer during the early growth period and more during the middle growth period. The time of jointing is also the time the young panicles begin to differentiate and the material nutrients are appropriately increased in amount to produce large panicles. Experimental results show increasing the number of spikelets of each panicle. An application of 12 jin of urea per mu produces an average number of 90.2 grains. An application of 15 jin of urea per mu produces an average number of 131 grains. An application of 20 jin produces an average number of 155.4 grains. The situation is similar for the number of filled grains per panicle. Although there are also other factors that affect fruiting, the effectiveness of fertilizers is still easily seen.

In addition, sidedressing around the roots after heading as an increased application of fertilizers for panicles is also an applicable means to increase yield. We sprayed 0.2 percent of dihydropotassium phosphate (produced by the Jiangshui Pugai Plant) once during the flowering period or the filling period after heading and compared it with the results of the experiment of spraying twice during the flowering and filling periods. There is a definite effect upon raising the fruiting percentage and increasing the grain weight. Spraying once during the peak flowering period raised the fruiting percentage by 2.5 percent and the thousand grain weight increased 4.03 percent. Spraying once during the filling period raised the fruiting percentage by 3.5 percent and the thousand grain weight increased 5.14 percent. Spraying twice during the peak flowering period and the filling period raised the fruiting percentage even more, reaching 10.6 percent but the increase in thousand grain weight was not large, only 1.2 percent. In general, these all have a definite effect upon increasing yield.

A summary of the above shows that the superiority of large panicles of hybrid superior varieties can be obtained by using the fertilization technique of applying a stable amount of fertilizer during the early period of growth, applying a larger amount during the middle period of growth and applying sidedressing to supplement the growth of grains as the method of increasing the application of fertilizers for panicles upon the prerequisite conditions of reasonably dense planting, sufficient base manure and a stable and long tillering period in accordance with different soil fertility.

IV. Question Concerning the Raising of the Yield of Seed Propagation

The basic demand for raising the yield of seed propagation is that the parents' flowering periods must meet well. Under this prerequisite, the key is to raise the fruiting percentage of cross breeds. At the same

time, the row ratio of the male and female parents should be considered. The male must have enough pollen to supply the female for pollination and the structure of the yield of the female must also be considered. Appropriate measures of cultivation should be determined by taking into comprehensive consideration the demands of these three aspects.

(1) The Difference in Sowing Periods Should Be Appropriately Determined Based Upon the Growth Characteristics of the Parents

Determining the difference in the sowing periods is the key to the entire process of seed propagation. The growth characteristics of the male parent variety guo ji 26 and the female parent variety er jiu nan No 1A are very different. The following characteristics have been observed in the growth manifestations at Chenguan during the 2 years of experiments.

Guo ji 26: When sowing during the last 10 days of March (vernal equinox), the entire growth period is between 164 and 180 days. The leaf age number last year was 18 to 19, and that in 1979 was 20 to 21 leaves. The period from sowing to the beginning of heading was 130 to 135 days, averaging 132 days. The heading period is concentrated. During the 2 years, the period from the beginning of heading to full heading lasted only 6 to 7 days. The uniformity was high and the beginning time of heading was relatively fixed. The beginning times of heading during the 2 years at Chenguan were all 2 days prior to or after the day autumn begins (August 8). On the other hand, its tillering strength is especially strong. The number of tillers on the single plant may reach over 30, and the number of effective tillers is close to 20. It manifests a strong tillering strength and the percentage of panicle formation is also high. When the flowering periods meet, the male parent has sufficient amount of pollen to supply the female's for pollinization.

Er jiu nan No 1A: When sown during the last 10 days of May (during Grain Fills), the entire growth period is about 100 days. The leaf age number is 11 to 12. The time from sowing to the beginning of heading lasts between 58 and 68 days, averaging 63.2 days. But its heading period is relatively long, lasting between 8 and 15 days, averaging 13 days, longer than the heading period of the male parent by 6 to 7 days. It seems that the change in the beginning time of heading is not large, mostly at the beginning of August. Generally, the tillering strength of the early maturing varieties with an ordinary number of leaf age of 11 to 12 is not very strong. But they actually produce more tillers. This is a kind of abnormal growth manifestation. The main reason is that when sparsely planted (19,000 to 22,700 plants per mu), additional sidedressing is applied before or after jointing to adjust the flowering period and this increases tillering during the later growth period and also raises the percentage of panicle formation. Therefore, the single plant has 6 to 8 effective panicles. Even so, the number of panicles per mu is still not high, between 110,000 and 160,000, and the fruiting percentage is not high, about 16 to 22 percent. Therefore, yield of seed propagation is not ideal.

Experimental results indicate the number of effective tillers of the single plant of the male parent can reach more than 20. Judging from the pattern of simultaneous extension of leaves and tillers, the difference in the number of leaves from the first tiller to the 20th tiller is at least 7 leaves. Calculating on a leafing speed of an average of 6 days, the time difference is more than 40 days. But each tiller can achieve full heading within 6 to 7 days. It can thus be seen that guo j1 26 is a variety strongly sensitive to light. Therefore, the difference in the time of sowing of the male parent for the 2 planting periods was about 10 days and the extension of the duration of heading will not be obvious. But the female varieties are different. The difference in the number of leaves between the first and the 5th tillers is only three leaves. The average leafing speed as observed is 5 days and the time difference is only 15 days. The duration of heading is mostly 14 to 15 days, and basically the first tillers yield panicles first and the later tillers head later. They are slow to react to light and therefore are the type that is strongly sensitive to temperatures. Based on this characteristic, consideration must be given to a well-matched beginning flowering period when determining the time difference in sowing for a meeting of the flowering periods. Consideration must also be given to make sure that the duration of flowering must also basically coincide. Otherwise, there will always be a part of the panicles of the female varieties that will not flower at the proper time.

Combining the above results, it is believed that when the summer temperatures in Jianshui are relatively stable, the basis for determining the difference in sowing time of the male and the female parents can be in the leaf age number or in days. When the male parent has 12 to 13 leaves, the female parent should be sown. The female parent should be sown about 70 days later than the male parent. The question concerning how to shorten the duration of heading of the female parent should be considered from measures of cultivation.

(2) Major Measures To Raise the Fruiting Percentage of Cross Breeds

Results of observation indicate the plant height of the female variety is generally within the range of between 49 and 57 centimeters. The female variety is an especially short stemmed variety. It should be planted in a high density. But in the ordinary seed propagation fields of today, the number of effective panicles per mu is mostly between 120,000 and 160,000, and individual high yielding fields also only have about 200,000. The planting density is obviously not dense enough. Therefore it is believed that under the prerequisite of a good meeting of the beginning time of heading, improving the technique of cultivation must assure that the number of effective panicles of the female parent is above 200,000 mu and the tillering of the single plant must be controlled so that heading can be concentrated as much as possible to allow the duration of heading of the male and the female parents to be basically consistent and the entire flowering period can coincide well. This seems to

be the key to raising the fruiting percentage of cross breeds. We also proved in our examination of the high yielding fields for seed propagation that single plants with an average of 4.9 effective panicles can yield 34.4 filled grains per panicle. The fruiting percentage is close to 30 percent. The yield of the single plant weighs 4.7 grams. Single plants with an average of 6.8 effective panicles yield only 21.5 filled grains per panicle. The fruiting percentage is only 22 percent. The yield of the single plant weighs only 4.1 grams. It can be seen that with the female parent, the single plant with less number of panicles produces a higher yield and the percentage increase in yield reaches 14.6 percent. Thus it is believed that there are two ways to consider improving the cultivation of the female.

1. Increase the planting density of the female: The current planting density of between 20,000 and 25,000 plants per mu can be increased to between 45,000 and 55,000 plants. In the method of cultivation, consideration is given to the males. The present row distance among the plants provides better growth and does not need to be changed, i.e., 3 x 40 cun with 5,000 plants planted in 1 mu. The basic number of seedlings of the female can be enlarged mainly by shortening the row distance among the female plants and the row distance between the female and the male plants. Preliminary consideration shows there are two methods: (1) a row ratio of 6:1, the row distance between the male and the female is changed from 10 cun to 7.5 cun, the row distance between female plants is changed from 3 x 5 cun to 2 x 5 cun, and in this way, 45,000 basic seedlings can be planted in 1 mu; (2) a row ratio of 7:1, the row distance between the male and the female is changed to 8 cun, the row distance between female plants is changed to 2 x 4 cun, and in this way, 54,500 of basic seedlings can be planted per mu. The average number of formed panicles on the single plant should be controlled between 5 and 4. The number of effective panicles per mu can be raised to above 200,000. Tender seedlings with three leaves should be transplanted shallowly and efforts made to obtain tillering at low positions and concentrate the duration of heading.

2. Under the prerequisite condition of assuring that the beginning times of heading meet in determining the appropriate difference in sowing times, sidedressings should be applied in appropriate amounts and early so that early stimulation and early control can be realized. Application of too much nitrogenous chemical fertilizers during the middle and the late period of growth should be avoided as much as possible.

In addition, timely removal of the boot leaf, spraying of "920" and insistence on human assistance in pollination during the flowering period and such techniques and measures are all effective measures to raise the fruiting percentage of cross breeds and which must be firmly implemented. They should not be neglected.

BRIEFS

WATER RESOURCE RECOMMENDATION--Beijing, 11 Aug--The Chinese Geological Society recently offered a recommendation for controlled use and exploration of China's water resources. The geologists pointed out in their recommendation that the tapping of underground water has gone all out of control in China. Any unit with well-sinking equipment can sink wells in areas under its jurisdiction to satisfy its own needs without giving any thought to the interests of the entire society of providing ways for protecting and replenishing underground water sources. This has caused continuous lowering of water tables in many areas. The geologists suggested that permits first be obtained by any unit that wants to sink a water well, that centralized plans be worked out for tapping and using both surface and underground water resources, and that a centralized agency be set up for implementing the water resource law. [Beijing XINHUA Domestic Service in Chinese 0156 GMT 11 Aug 80 OW]

PIGSKIN PRODUCT FAIR--Beijing, 10 Aug--The successful national pigskin product fair sponsored by the Ministry of Light Industry closed in Beijing on 10 August. Over 500,000 people visited the fair which lasted over, month. [as printed] The fair sold 400,000 pairs of men's and women's leather shoes and over 100,000 leather suitcases and other pigskin products, including leather clothing, with total sales reaching 5 million yuan. The competition for sales at the fair between provinces, municipalities and autonomous regions was quite sharp. At the fair the supply of many products could not meet the demand. Leading comrades of the second light industrial departments in all localities and technical personnel concerned also held discussions to exchange experience for improving the quality of pigskin products. [OW121535 Beijing XINHUA Domestic Service in Chinese 0826 GMT 10 Aug 80 OW]

NATIONAL METEOROLOGICAL CONFERENCE--Nanchang, 11 Aug--The participants at the national academic conference on meteorology recently proposed that, in the course of modernization, all localities should make full use of the meteorological resources and act in accordance with weather changes. The conference was sponsored by the China Institute of Meteorology, took place on Lushan Mountain of Jiangxi and was attended by more than 100 experts and professors. Rao Xing, advisor to the Central Meteorological Bureau, proposed that meteorological resources should be used in deciding agricultural planning in the countryside. This is of great significance for accelerating China's agricultural modernization. [Beijing XINHUA Domestic Service in Chinese 0134 GMT 11 Aug 80 OW]

INCREASED VEGETABLE OIL PRODUCTION--Nanning, 13 Aug (XINHUA)--Output of rice bran oil and corn oil rose by 23 percent to 50,000 tons in the first half of this year, according to figures released at an oil production experience exchange meeting held here recently. Since 1977, the state has allocated 60 million yuan in special funds for new equipment and improving the technical processes for oil extraction. Total output of rice bran oil and corn oil was 89,000 tons in 1979, double that of 1976. Producers throughout the country have gained experience in the past few years. Hunan Province now has 300 rice processing plants with oil-extracting workshops attached. They get 12.4 kilograms of oil from 100 kilograms of rice bran. Shanghai now gets 13.84 kilograms per 100 kilograms. [Text] [Beijing XINHUA in English 0220 GMT 13 Aug 80 OW]

COMMERCIAL CATTLE BASES--China has made headway in building commercial cattle bases. According to incomplete statistics, there are some 1.2 million head of beef cattle of improved breed being raised at various commercial cattle bases throughout the country. By the end of June, China had exported 10,000 head of beef cattle. [Beijing Domestic Service in Mandarin 1200 GMT 16 Aug 80 OW]

CSO: 4007

BRIGADE PROFITS FROM RULES

OW110859 Hefei Anhui Provincial Service in Mandarin 1100 GMT 10 Aug 80

[Summary] Zhang Jiashun, secretary of Zhangshuang production brigade, Yingshang County, in 1975 laid down a number of rules concerning cadres work style and which placed members of the party branch under the supervision of the masses. These rules were: Cadres had to perform labor to get work points, the same as commune members; families of cadres were not allowed to bully the masses; cadres' dependents had no privileges or priority over the masses in such matters as employment, joining the army and advancement in education; rather, priority was to be given to children of animal tenders, forest guards and model commune members; extravagant dinners and embezzlement were prohibited. These rules which were laid down at the time when the "gang of four" was on the rampage, were especially welcomed by the masses. They have been strictly observed ever since.

Since commune members' enthusiasm was aroused, all the brigade's 5,400 mu of land have been turned into neatly square paddy fields, 20 roads, 22 power operated-wells, 8 ponds and 8 drainage ditches were built and 180,000 trees planted; 32 plants, workshops and kilns have been established and 200,000 fish raised. The brigade now has 3 cars, 100 pieces of farm machinery, 50 processing machines and 330 new housing units for commune members. In 1979, the average income of its commune members was 250 yuan, or 8 times that in 1975. Each household has 2 or 3 pigs and a number of other domestic animals and poultry. Twenty households have bank deposits over 10,000 yuan each and 34 households over 1,000 yuan each.

One day in late May of this year, Comrade Zhang Jingfu, first secretary of the provincial CCP committee, made an inspection tour of this brigade and spoke very highly of its contribution toward building a new socialist countryside.

CS0: 4007

BRIEFS

WHEAT-PRODUCTION MEETING--To sum up experience in winning bumper wheat harvests and make arrangements for sowing wheat this fall, the Anhui Provincial Agriculture Commission and the provincial science and technology commission held a meeting in Huaibei Municipality from 6 to 10 August. It was attended by major wheat-producing counties throughout the province. Governors Yang Jike and Meng Fulin addressed the meeting. The participants said that the province's wheat production is still low and unstable despite some progress made in the past 3 years. They urged leaders in various areas to make good use of scientific and technical personnel and to popularize scientific farming. [OW172105 Hefei Anhui Provincial Service in Mandarin 1100 GMT 16 Aug 80 OW]

RAPESEED DELIVERY--By the end of July, Anhui Province had bought 326 million jin of rapeseeds, increasing 101 million jin over the same period of 1979 and overfulfilling the annual procurement plan by 86.5 percent. [OW140038 Hefei Anhui Provincial Service in Mandarin 1100 GMT 11 Aug 80 OW]

CROPFIELDS FLOODED--Various counties in Xuancheng Prefecture, Anhui, are struggling to drain waterlogged fields in an effort to wrest a bumper harvest of grain and cotton crops this fall. Since early August, torrential rains have fallen in the upper reaches of the Changjiang River, causing its water level to rise. On 13 August, the water level of Wuhu reached 10.91 above the emergency level, flooding many areas. On 12 August, many counties in the prefecture recorded 100 to 150 mm of rainfall, and 245,000 mu of agricultural crops were flooded. [OW181441 Hefei Anhui Provincial Service in Mandarin 1100 GMT 17 Aug 80 OW]

SUMMER GRAIN PROCUREMENT--As of 14 August, over 900 million jin of summer grain had been purchased and stored in granaries in Anhui Province, fulfilling 105.35 percent of the province's summer grain purchasing plan. Because of natural disasters, the amount of summer grain purchased this year is less than that for the same period last year. Purchasing of summer grain is still in progress in many areas of Anhui. [OW181441 Hefei Anhui Provincial Service in Mandarin 1100 GMT 17 Aug 80 OW]

PROVINCE CITED AS MODEL FOR SUGAR CANE PRODUCTION

OW181308 Beijing XINHUA in English 1245 GMT 18 Aug 80

[Text] Beijing, August 18 (XINHUA)--Today's PEOPLE'S DAILY gives front-page prominence to the question of tailoring production to local conditions.

It cites the example of Fujian Province in east China, where total output of cane sugar reached 371,000 tons during the 1979-80 sugar refining period, compared with 112,000 tons during the same 1975-76 period. The area under sugar cane has in four years expanded by 13,300 hectares and yields have increased by 22.5 tons per hectare.

The newspaper attributes this progress to government supplements of grain, which encourage Fujian peasants to increase sugar cane production. An extra of 714,500 tons of grain have been distributed under the policy since 1976. Each rural collective is supposed to sell a fixed amount of sugar cane to the government and for each ton sold beyond that quota, the producers are entitled to an extra 125 kilograms of grain to augment food rations.

In addition, each ton sold within and over the quota brings them extra ration tickets for 25 kilograms of chemical fertilizer and ten kilograms of sugar.

In areas south of the Minjiang River in Fujian Province, one ton of sugar can be refined from the sugar cane output from 1.7 to 1.8 mu of land (there are 15 mu in a hectare). The corresponding figure for the entire country is three mu.

Unfortunately, these areas are densely populated, with an average of one hectare of farmland every 30 people. In past years, peasants [words indistinct] on food production because they got little grain in return for growing sugar cane. As a result, output of sugar dropped from 180,000 tons to 112,000 tons between 1966 and 1975.

A frontpage editorial in the PEOPLE'S DAILY describes the experience of Fujian Province as a model for all provinces in the planning of agricultural production. The editorial says, "Southern Fujian is suitable for growing sugar cane and it would be inappropriate to force people there to try to become self-sufficient in grain."

As a matter of fact, the editorial continues, "It is impossible for any individual community, no matter how prosperous it might be, to achieve self-sufficiency in everything it needs in production and for the livelihood of its people. It has to depend on the exchange of commodities with other communities."

CSO: 4020

BRIEFS

RICE HARVEST--Fuzhou, 13 Aug--Fujian Province has reaped a bumper harvest of early rice this year with total output reaching as high as 6,448 million jin. This figure represents a 0.9 percent increase from 1979, which was also a good harvest year. The average per-mu yield reaped from the more than 11 million mu of early rice of the province this year was 573 jin, topping last year by 2.14 percent. [Beijing XINHUA Domestic Service in Chinese 0348 GMT 13 Aug 80 OW]

SUGAR PURCHASES--During the refining season of 1978 to 1979, 319,300 tons of sugar were purchased in Fujian, reaching the highest level ever recorded. In the 1979-1980 refining season, the state also purchased 361,800 tons. Compared with the refining season of 1975 to 1976, output in 1979-1980 increased 2.4 times. Due to the good development of sugar-cane production, sugar delivered to other areas outside the province reached 180,000 tons a year, an increase of 400 percent over 1976. In 1979, industrial use of sugar increased by 39.4 percent over 1976. In the first half of this year, 68,000 tons of sugar were purchased, an increase of 17 percent over the corresponding period of 1979. [HK200148 Fuzhou Fujian Provincial Service in Mandarin 1035 GMT 17 Aug 80 HK]

CSO: 4007

BRIEFS

MONGOLIAN COUNTY FOUNDING--Some 4,000 masses of various nationalities in Subei Mongolian Autonomous County, Gansu Province, held a rally on 10 August to celebrate the 30th anniversary of the county's founding. Attending the rally were (Li Hongfan), representative of the nationalities affairs commission under the NPC; Huang Zhengqing, deputy governor of Gansu Province; and delegations from Nei Monggol Region, Qinghai Province and other localities. (Cai Deng), deputy secretary of the Subei County Party Committee and vice chairman of the Subei County Revolutionary Committee, delivered a speech at the rally. He said: Over the past 30 years, all undertakings in the county have developed quickly. Compared with 1949, the county's animal husbandry has increased 10 times; agriculture, 15 times. The local industrial output value is 7.48 million yuan. [SK201156 Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 12 Aug 80 SK]

CSO: 40^7

UNDERGROUND STREAMS DISCOVERED IN PROVINCE

OW161230 Beijing XINHUA in English 1220 GMT 16 Aug 80

[Text] Beijing, August 16 (XINHUA)--China's hydrogeological workers have after five years of surveys identified 677 underground streams with a total length of 4,247 kilometers in the dry northern mountainous area of Guizhou Province, according to the Ministry of Geology.

These water resources have the capacity of irrigating 360,000 hectares of land. At present, about 200,000 hectares are irrigated.

Zhenyuan County has built a small hydroelectric station using an underground stream as water power. It supplies energy for the local commune-run industries and electric light for peasant homes.

The geologists have also found 3,269 springs in the area with a total discharge of 24,780,000 tons of water per 24 hours.

Guizhou's northern mountainous area, which averages 1,000 meters above sea level, covers an area of 87,000 square kilometers. It is one of the major grain producing areas in the province. As it lies in a karst area with strong permeability, the region always suffered from a surface water shortage and drought in the past.

In order to tap the subterranean water, the hydrogeological workers have carried out a general survey in southwest and central south China in the past few years. They have identified the water flows, discharge and cause of formation of the underground streams. In the red soil areas in northwest Sichuan and central and west Guizhou, they have discovered some strata carrying abundant water which can be used for industrial and agricultural production and the people's living.

CSO: 4020

SWEDISH FORESTRY DELEGATION TO VISIT HEILONGJIANG FOR TALKS

LD201001 Stockholm SVENSKA DAGBLADET in Swedish 14 Aug 80 p 21

[Unattributed report: "China Wants to Buy Forestry Technology"]

[Text] China's Heilongjiang Province--What used to be Manchuria--could begin cooperating with the Swedish forestry industry.

The Chinese Forestry Ministry has announced its interest in letting this province be the geographical area where Swedish forest clearing and timber treatment techniques could be used.

On Sunday a delegation comprising representatives of 10 companies with Ambassador Johan Nordenfalk at its head will travel to Beijing to discuss cooperation.

Sweden is interested in exporting consultative services and forestry machinery. The Chinese wants to buy Western technology to build up a forestry industry of their own. China, which was once heavily forested, has, as a result of thousands of years of tree felling, a timber industry that is only half as large as that of Sweden. The plans therefore include extensive new planting.

The Swedish companies that will take part in the visit are Hilleshoeg, Enab-Husqvarna, Hiab Foco, Sandvik, Kockums Industri AB, Sunds Defibrator, Perstorp, the engineering company C.H.E. Johnson, Statsfoeretag and Cilvi Consult.

The Swedish forestry delegation's visit is a result of industry Minister Nils G. Aasling's earlier visit to China.

"The delegation can be seen as the embryo of a forestry consortium," Johan Nordenfalk said. The model for it is the Swedish mining consortium formed earlier to negotiate with the Chinese.

CSO: 3109

BRIEFS

FORESTRY ENTERPRISES--By the end of July forestry enterprises in Heilongjiang Province had prefulfilled the annual profit plan by 5 months. Profits handed over to the state totaled 33.9 million yuan, doubling the annual profits expected to be handed over to the state. Profits accruing from the comprehensive utilization of timber increased 36.9 percent over the corresponding 1979 period. [SK170122 Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 13 Aug 80 SK]

CSO: 4007

BRIEFS

NATURAL DISASTERS--In Jingzhou Prefecture, 1.2 million yuan of relief funds have been paid to the people in the disaster affected areas. A total of 10,000 tons of chemical fertilizer have also been distributed. By 29 July, 3.4 million mu out of 3.89 million mu of farmland have been drained from floods. Some 185,000 mu of farmland have been planted with alternate crops. Heavy rain fell in the prefecture from 17 to 20 July with some areas experiencing rainstorms, causing floods. Each household of the affected communes has now received 1 to 2 mu of farmland to plant vegetables or grain. The affected areas will not take part in large-scale farmland capital construction this winter and next spring, so as to concentrate on doing a good job of production next year. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 3 Aug 80 HK]

CSO: 4007

BRIEFS

COTTON PRICE CIRCULAR--Recently, the Hunan Commodity Price Committee and the Hunan Supply and Marketing Cooperative issued a joint circular on increasing the purchasing price of cotton by 10 percent effective in 1980. [Changsha Hunan Provincial Service in Mandarin 1100 GMT 8 Aug 80 HK]

PREFECTURE FLOOD--After overcoming serious floods, the people in Changde Prefecture are striving to resume production. Since the flood season, they overcame threats from five floods. However, they suffered losses in the production of early rice. Late rice which had already been transplanted and cotton were flooded, causing serious losses. In Hanshou County, 570,000 mu of late rice was originally planned for transplanting, but had been increased to 610,000 mu. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 12 Aug 80 HK]

RAINFALL ACCOUNT--From 30 July to 11 August, heavy rain and rainstorms continuously fell on north of Hunan. Some 250 millimeters fell in Xiangxi Tu-jia-miao Autonomous Prefecture and Changde Prefecture. The center of the rain was in Shimen County. According to an analysis the average water level in Dongtinghu is expected to exceed the emergency level. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 12 Aug 80 HK]

CSO: 4007

BRIEFS

COMPULSORY RETIREMENT SCHEME--Shanghai Aug 17 KYODO--A leading Chinese people's commune has introduced an age limit system for its workers which is catching public fancy. The compulsory retirement system, first of its kind, has helped commune authorities improve work efficiency. Meanwhile, retiring workers have appreciated the guarantees provided for their future livelihood. According to the managerial staffers of the Malu Agricultural Cooperative Association in the Jiangsu Province surrounding Shanghai, the retirement age was set at 65 for male farm workers and 60 for workers engaging in light industry. Retiring workers receive a monthly pension of yuan 10-23 in cash, besides the delivery of foodstuffs. So far some 2,000 workers have retired in the cooperative organization since January in 1979 when the age limit system was introduced on a trial basis. In Chinese national enterprises and public corporation workshops, the compulsory retirement ceilings have been set at 60 years for male workers and 50 years for female workers and this too has been enjoying popular fancy. The Shanghai commune authorities expect their trial introduction of the retirement system will strongly influence other cooperative organizations across the country in the foreseeable future. [Text] [OW170951 Tokyo KYODO in English 0858 GMT 17 Aug 80]

FLOOD WARNING--The Jiangsu Provincial Antiflood and Antidrought Center has called on various localities of the province to be prepared to fight flood and waterlogging. A report on the (?tropical) high pressure in the Pacific area issued by the center said that the rainy season has arrived in the lower reaches of the Changjiang River from the upper reaches and that rainstorms have hit most parts of the province since yesterday. Owing to heavy rainfall in the Changjiang River Valley, the river water level at Nanjing on 12 August has risen to 8.52 meters, higher than the warning levels. It is estimated that the Changjiang River water level at Nanjing will reach as high as 8.6 meters on 17 August, the center said. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 12 Aug 80 OW]

CSO: 4007

BRIEFS

EARLY RICE--This year, the peasants in Jiangxi reaped another good harvest of early rice from 24.5 million mu. Unit output increased by 15 jin over last year, an increase of 2.7 percent. In Yichun Prefecture and Nanchang Municipality, the increase in output was comparatively higher, increasing by 5.2 and 6.7 percent respectively. The unit output in Pingxiang Municipality was the highest in the province with an average per mu yield of 182 jin. This was an increase of 6.9 percent over last year. During the early period before early rice production this year, prolonged rain and low temperatures prevailed throughout the province, causing extremely unfavorable conditions for sowing early rice. In the first half of this year, 1.2 million tons of chemical fertilizers were sold. This was an increase of 42.6 percent over the corresponding period of 1979. [Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 13 Aug 80 HK]

CSO: 4007

BRIEFS

LIAONING GRAIN CENTER--Shenyang, August 15 (XINHUA)--The Liaohe River Plain with 1.5 million hectares of farmland in Liaoning Province is becoming one of the principal suppliers of market grain in northeast China. The province has decided to increase the output of grain and soybeans on the plain and at the same time develop production of oil-bearing crops, livestock and poultry, fisheries, forestry and commune and brigade-run industries to achieve an all-round development of the rural economy. The area will combine agriculture with industry and commerce. The fertile soil, mild climate, adequate rainfall and abundant water resources enabled the 17 counties and districts on both sides of the river to account for almost two-thirds of the province's total grain delivery to the state last year. Average annual per capita income was 125 yuan, higher than the average for the province's whole rural population. The Liaohe River Plain's rural population is 8.15 million, 35 percent of the province, and the area accounts for a shade over 36 percent of Liaoning's farmland. In designating the area a major market grain producer, the Provincial Party Committee decided to increase mechanized ploughing, which is now done on 80 percent of the farmland, and sowing and cultivation, now 30 percent mechanized. [Text] [OW162043 Beijing XINHUA in English 1214 GMT 15 Aug 80]

COCOON OUTPUT--Shenyang, 14 Aug--Peasants of mountain areas in the eastern part of Liaoning Province have reaped a bumper harvest of spring cocoon this year with the total output of silkworm cocoon reaching some 60,000 dan, a little bit higher than that of 1979. [Beijing XINHUA Domestic Service in Chinese 0135 GMT 14 Aug 80 OW]

SMALL ENTERPRISES--The Liaoning Provincial Finance and Trade Office recently adopted the following measures to promote commune and brigade-run enterprises: 1) Carry out coordination work between communes and departments concerned to run farm and sideline product bases and processing plants. 2) Help communes develop cash crop processing plants. 3) Trial run cotton ginning mills owned by the state and collectives in cotton-producing areas. 4) Help communes run restaurants, nonstaple foodstuff stores, green groceries and special and local products stores. 5) Give communes the authority to decide what to do with surplus grain and oil they produce after fulfilling state quotas. 6) Appropriate 5 million yuan for credit loans beyond last year's grants of 260 million yuan. 7) Support communes in developing the coal industry and exempt from taxes those communes utilizing waste coal to produce bricks. [Shenyang Liaoning Provincial Service in Mandarin 2200 GMT 10 Aug 80 SK]

POLICIES TO PROMOTE ECONOMIC DEVELOPMENT ADOPTED

OW190531 Beijing XINHUA in English 0324 GMT 19 Aug 80

[Text] Hohhot, August 19 (XINHUA)--The Inner Mongolia Autonomous Region has decided on policies to allow the people greater initiative in expanding the collective and individual economy. This is intended to enable the people of Mongolian and other nationalities to improve their livelihood and is part of the present readjustment of the national economy.

The policies:

--to encourage every area to develop farming, animal husbandry or forestry in line with local conditions instead of putting one-sided emphasis on grain production, and to increase the region's tree and grass cover in order to restore the ecological balance;

--to encourage all offices, organizations, factories, mines, schools and communes to grow trees and grass and these will belong to the growers;

--the grain collection and purchasing quotas for those counties with surplus grain will remain unchanged for five years and the state will pay a higher price for grain purchased over and above the set quotas, while in grain deficient areas agricultural tax will not be collected;

--in farming and stockraising areas, the private plots of the peasants and herdsmen will be enlarged and there will be no restriction on the number of livestock they keep for their own use;

--tree and fodder plots will be allocated to commune members and will be kept for their own use for a fairly long period;

--in the cities, collective enterprises and individual undertakings which cater to the needs of the people and add to social income will be allowed, and most of the industrial and commercial enterprises to be set up in cities in the region in the near future will be run collectively; and

--In the distribution of income, the principle of "to each according to his work" will be adhered to. In cities, the piece work system will be put into effect wherever possible for work groups or individuals.

The Communist Party Committee of the Inner Mongolia Autonomous Region has also decided to give government enterprises greater right in matters of management and improve the circulation of goods.

CSO: 4020

BRIEFS

PRESERVED FOREST DISCOVERED--Xining, August 17 (XINHUA)--The biggest, well-preserved virgin saksaul forest so far known in China has been discovered in the Qaidam Basin of Qinghai Province by Professor Hou Xueyu of the Institute of Botany of the Chinese Academy of Sciences. The forest covers an area of more than 300 square kilometers. Professor Hou, plant ecologist and geobotanist, who went there in July this year to make a survey, proposed that the area be set aside as a natural conservation zone for scientific research. The provincial government has accepted his proposal. The Chinese saksaul is an alkali-resistant and drought-resistant semi-arboreal and a major plant used for afforestation in desert areas. It grows in some parts of Inner Mongolia, Xinjiang and Gansu. The saksaul forest in the Qaidam Basin was found in an uninhabited area 2,710 meters above sea level. The plants there are from 2.5 to four meters tall. Most parts of the Qaidam Basin, located in the western part of Qinghai Province, are covered with sand and gravel. Rainfall there is scarce and evaporation very high. The saksaul plants serve as a good natural sand-fixing windbreak and will provide data for research. [Text] [OW170736 Beijing XINHUA in English 0725 GMT 17 Aug 80]

LIVESTOCK PRODUCTS--Xining, 13 Aug--Qinghai Province, one of China's major pastoral areas, has more than 21.5 million head of livestock, including 16 million head of sheep and 4.88 million oxen. Each year the state procures 30 million jin of sheep wool, 0.4 million sheets of ox hide and 1.77 million sheets of sheep hide from this province. After fulfilling the state procurement quota, Qinghai's herdsmen can keep for themselves 2.49 million jin of sheep wool, 0.22 million sheets of ox hide and an equal number of sheep hides that they turn over to the state annually. [Beijing XINHUA Domestic Service in Chinese 0218 GMT 13 Aug 80 OW]

AGRICULTURAL POLICY--The Qinghai Provincial People's Government recently decided to raise the purchasing price of export broad beans effective 1 September. It decided that the purchasing price for every 100 jin of top quality broad beans will be raised from 15.9 yuan to 17.9 yuan. As for purchasing extra amounts of broad beans, 30 percent will be added to the new purchasing price. The cost of every 100 jin of broad beans will be 26.9 yuan. [SK210937 Xining Qinghai Provincial Service in Mandarin 2330 GMT 10 Aug 80 SK]

CIRCULAR ISSUED--The Qinghai Provincial People's Government recently issued a circular calling on various areas in pastoral region to make good use of their time in carrying out the mass activity of cutting forage grass so as to insure that animals will have enough fodder in the winter and spring. The circular urges: In cutting forage grass, it is necessary to follow the principle of assigning cutting output quotas for teams and individuals and awarding those who have overfulfilled their quotas. Good jobs should be done in the work of cutting, drying and baling grass as well as grass storage. The circular also demands that attention be paid to selecting outstanding grass strains next year while vigorously harvesting forage grass. [Xining Qinghai Provincial Service in Mandarin 1100 GMT 16 Aug 80 SK]

CSO: 4007

BRIEFS

AUTUMN FARMING--Xian, 14 Aug--Shaanxi's summer grain output has declined this year because of the effects of a long drought during the first half of the year. For this reason, the province expects to reap two-thirds of its total annual grain output from autumn crops. More than enough rainfall and lower temperatures experienced by the province since the beginning of June have, however, created great difficulties in autumn farming. From the middle of June to early last month 45 counties in 7 prefectures were hit by floodwater and hailstorms. More than 670,000 mu of autumn crops were damaged to varying degrees. To deal with this situation, the provincial CCP committee and the provincial people's government called on the rural areas to promote autumn crop field management as their supreme central task in this and in coming months. Thanks to the peasants' efforts, more than 17 million mu of early autumn grain crops and 3.7 million mu of cotton have been weeded twice and additional manure has been applied to these farmlands to spur already-delayed crop plant sprouting. [Beijing XINHUA Domestic Service in Chinese 1204 GMT 14 Aug 80 OW]

CSO: 4007

BRIEFS

LIVESTOCK BREEDING--Jinan, 21 Aug (XINHUA)--Shandong Province has promoted livestock breeding in the past year and more. During the first half of this year the province had 41,400 head of meat ox, 7 times that of the same period of 1979. In addition, Shandong peasants raised more than 9.96 million head of sheep and some 26.1 million rabbits, topping the respective figures for the same period for 1979 by 25.72 and 30.52 percent. The province has 109 million mu of arable land from which peasants can collect 80 billion jin of crop stalk each year. About 40 billion jin of crop stalk can be used as fodder. [OW211505 Beijing XINHUA Domestic Service in Chinese 0237 GMT 21 Aug 80 OW]

COTTON CROP MANAGEMENT--Shandong Province has strengthened late stage field management of cotton crops. The 9.3 million mu of cotton planted by Shandong this year are thriving now. [Beijing Domestic Service in Mandarin 1200 GMT 19 Aug 80 OW]

CSO: 4007

BRIEFS

TORRENTIAL RAINFALL--The party organization of the Shanghai Municipal Agriculture Commission held an emergency meeting on the morning of 17 August to discuss the recent continuous torrential rainfall in the suburbs which is detrimental to agricultural production and the measures to dry the newly-reaped grain crops and to open up more ditches in the cotton, paddy and vegetable fields. The meeting was presided over by Comrade Chen Zonglie, Standing Committee member of the Shanghai Municipal CCP Committee. At noon, the commission issued an urgent circular urging the various counties to arouse the masses to take part in the antiwater-logging struggle to protect grain crops. [Shanghai City Service in Mandarin 2300 GMT 17 Aug 80 OW]

CSO: 4007

BRIEFS

AFFORESTATION RESULTS--Beijing, 19 Aug (XINHUA)--Xinjiang Region has achieved remarkable results in urging collectives and individuals to plant trees and forests. During spring this year, Xinjiang afforested 394,000 mu of land, planted 88 million trees and cultivated 147,000 mu of saplings. [OW201107 Beijing XINHUA Domestic Service in Chinese 0727 GMT 19 Aug 80 OW]

CIRCULAR ON LIVESTOCK--The Xinjiang Regional People's Government recently issued a circular calling on all areas to begin making preparations to protect livestock from natural disasters next winter. The circular said Xinjiang has scored good results in developing livestock breeding this year because it resolutely implemented the economic policies on agricultural and pastoral areas of the CCP Central Committee and the regional party committee. According to statistics, the region's total number of livestock as of the end of June was 1.5 million head more than the corresponding period of last year. The circular said that in view of the long dry spell in the region, all areas should prepare sufficient grass feed for their livestock during the winter. [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 17 Aug 80 OW]

SCIENTISTS SURVEY 'NATURAL RESERVE'--Urumqi, August 21 (XINHUA)--One hundred Chinese scientists have finished surveying Harnes, a natural reserve, at the foot of the highest peak of the Altay mountains in Xinjiang, northwest China. Xinjiang is at the Europe-Asia crossroads for various flora. The scientists collected more than 300 specimens of plants, 80 of birds and animals, and 400 of insects. Thanks to its high latitude, the area is rich in coniferous trees, the only kinds in China like those of North European and Siberian species. The scientists discovered new species of wild plant life, many of which are closely related to such cultivated plants as beans, scallions, garlic and chives. The area, the scientists found, is the only natural habitat in China for the grey squirrel, grouse and the flying squirrel. The reserve has a sickle-shaped lake, 25 kilometres long, two kilometres wide and 90 metres deep. Harnes Lake, 1,370 metres above sea level, was created by ancient glaciers. In the Mongolian language, Harnes means "river in mountain gullies." An ancient myth has it that a flower fairy accidentally dropped some flower seeds in the area, making it abundant in plant life while the surrounding area is barren. [Text] [OW220010 Beijing XINHUA in English 0720 GMT 21 Aug 80]

ZHEJIANG

BRIEFS

FRUIT HARVEST--Zhejiang has reaped a bumper harvest of summer-ripening fruits this year. Total output of watermelons reached 1.3 million dan, and production of pears, peaches, plums and other fruits rose by more than 20 percent over last year. Urban and rural markets throughout the province have an abundant supply of fruits of a great variety and fruit prices remain the same as last year. Yiwu County has produced 100,000 dan of (shuanghua) pears this year. This figure tops last year by more than 50 percent. [Hangzhou Zhejiang Provincial Service in Mandarin 0400 GMT 12 Aug 80 OW]

CSO: 4007

II. PUBLICATIONS

TABLE OF CONTENTS OF 'YUNNAN NONGYE KEJI,' JAN 80

Kunming YUNNAN NONGYE KEJI [YUNNAN AGRICULTURAL SCIENCE AND TECHNOLOGY]
in Chinese No 2, 25 Jan 80 p 1

[Text] Table of Contents

Ordinary Patterns and Regular Occurrence of New Things Activities and Experience in the Application of Crop Genetics in Breeding Zhao Peizhi [6392 0012 2784].....	(1)
Study of Dwarfing and Fruiting Strength of Wheat Varieties Xu Feng [1776 7364].....	(5)
Several Views on Propagation of Xian Hybrid Rice Tian Changwei [3944 7022 0251] et al.....	(12)
Cultivating Paddy Rice Under Blue Light of Short Wavelength Ni Wen [0242 2429].....	(19)
Grasp Cultivation of Strong Seedlings, Raise Yield of Paddy Rice Agricultural Science Institute of the Yuxi Region.....	(24)
Several Links in the Techniques of Cultivating High Yielding Early Rice After Wheat Zheng Jiguang [6774 0679 0342].....	(27)
Foreign Studies To Prevent Damage to Paddy Rice by the Sogatella Furcifera Horvath Peng Zhongkui [1756 1813 7608].....	(30)
Preliminary Study of the Rise and Fall of the Myzus Persicae Sulzer Xu Shuyun [1776 2885 0061].....	(32)

Preliminary Study of Phosphorus in Red Soil and the Effective Function of Phosphorus Fertilizers Song Shuqiong [1345 3219 8825] et al.....	(35)
Strength of the Supply of Phosphorus in Colloidal Muddy Fields Zhang Taibai [1728 1132 4101] et al.....	(40)
Experiment in Storing the Semen of Male Oxen Under Low Temperature and the Effect of Fertility of the Dengzhou Cows Zhang Chunzhao [4545 4783 3564] et al.....	(42)
Dulong Ox--A Unique Bovine Species of the Central Part of the Hengduan Mountains of Our Province Gongshan County Animal Husbandry and Veterinarian Station.....	(49)
Mobile Adaptability to Temperature of the Membrane of Young Seedlings of Rye and Wheat Translated by Zhang Keyuan [1728 0344 6678].....	(51)
Record of the Content of Trace Elements and Secondary Elements in Chemical Fertilizers and Farm Manure Fertilizers Translated by Fan Yongyan [0461 3057 6056].....	(53)

9296

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